Voyager Bulletin

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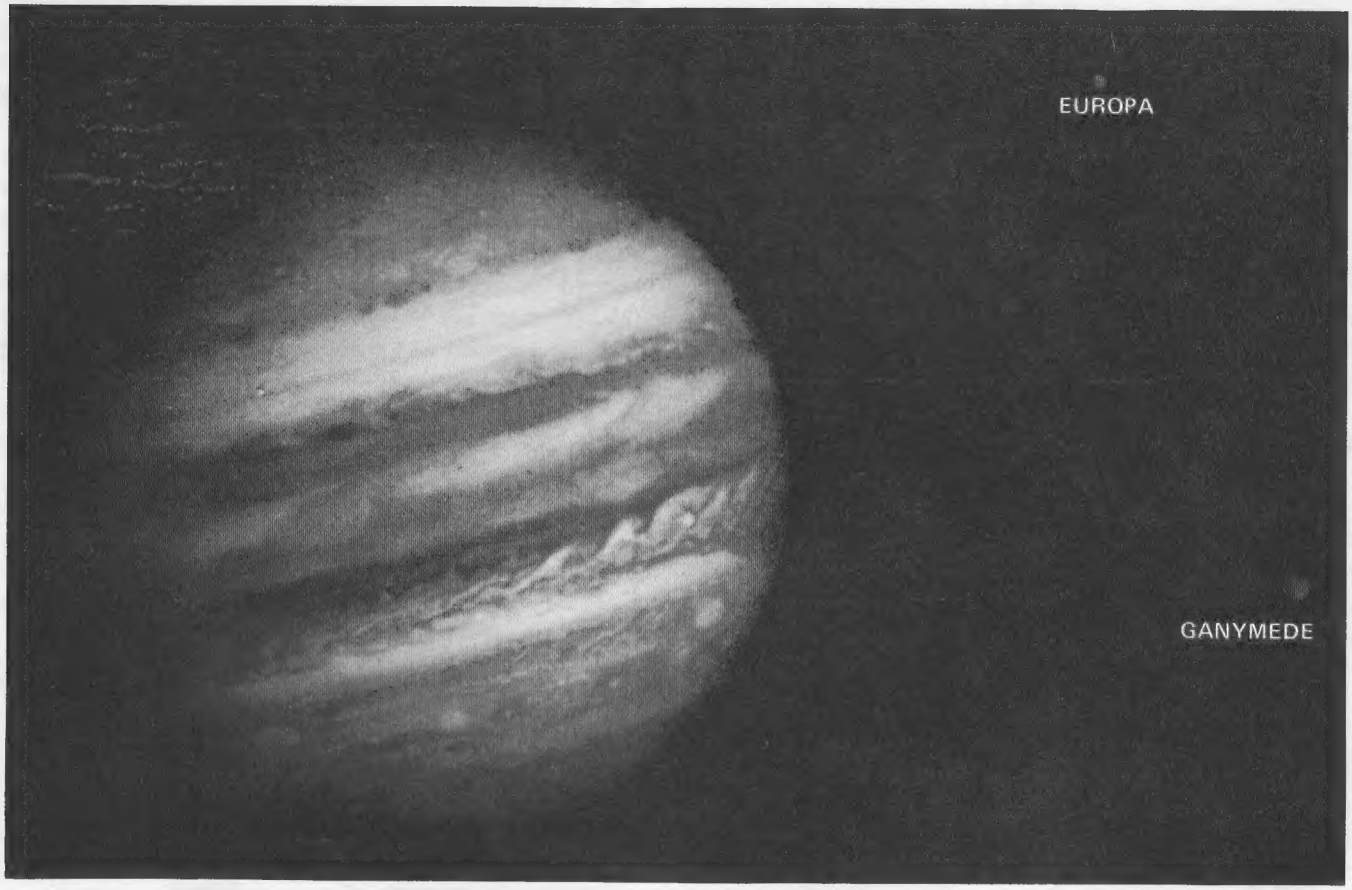

JUPITER'S MOONS — Voyager 1's cameras captured two of Jupiter's moons, Ganymede and Europa, in this picture taken the morning of January 17, 1979, from a distance of 47 million kilometers (29 million miles). Despite the small images of the moons, this photo and others are beginning to show details on the satellites not seen before in Earth-based photos.

Europa, an unusually bright satellite slightly smaller than the Moon, is revealed to have a dark equatorial band. Although scientists believe Europa is rocky, its surface appears to be covered with a layer of ice or frost of undetermined thickness.

Larger than the planet Mercury, Ganymede is believed to be composed of a mixture of rock and water ice with a surface of ice or frost with a scattering of darker soil. This photo shows only the darker side of Ganymede; the hidden half seen in other photos of the big satellite is marked by a large bright region.

Rapid changes in Jupiter's atmosphere are being observed — some occurring within 20 hours (two Jovian days). An example is changes in the long series of wave-like patterns trailing Jupiter's Great Red Spot (far right). The bright zone stretching across the northern hemisphere may be clouds of frozen ammonia similar to cirrus clouds of water ice in Earth's atmosphere.

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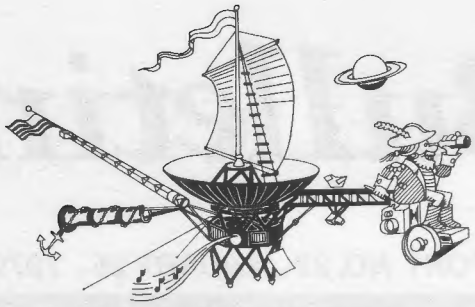


U.S.S. VOYAGER

Encounter Minus 38 Days and Closing

The days are ticking off rapidly as Voyager 1 closes in on its first major objective, the Jovian system. The "observatory" phase of Voyager 1's mission draws to a close January 30, with the last daily routine systems scans on January 25. These scans have provided valuable background measurements of the Jovian system which will help in later data analysis.

Using the images and data of the observatory phase, a target selection working group has identified the most interesting features to be examined for the highest science return, and computer sequences to target to these areas are being completed.

Trajectory Correction Maneuver January 29

On January 29, Voyager 1 will fire its hydrazine thrusters to adjust its flight path. One more trajectory correction maneuver is scheduled for February 20 to put the spacecraft exactly on target for its audience with the giant planet in early March.

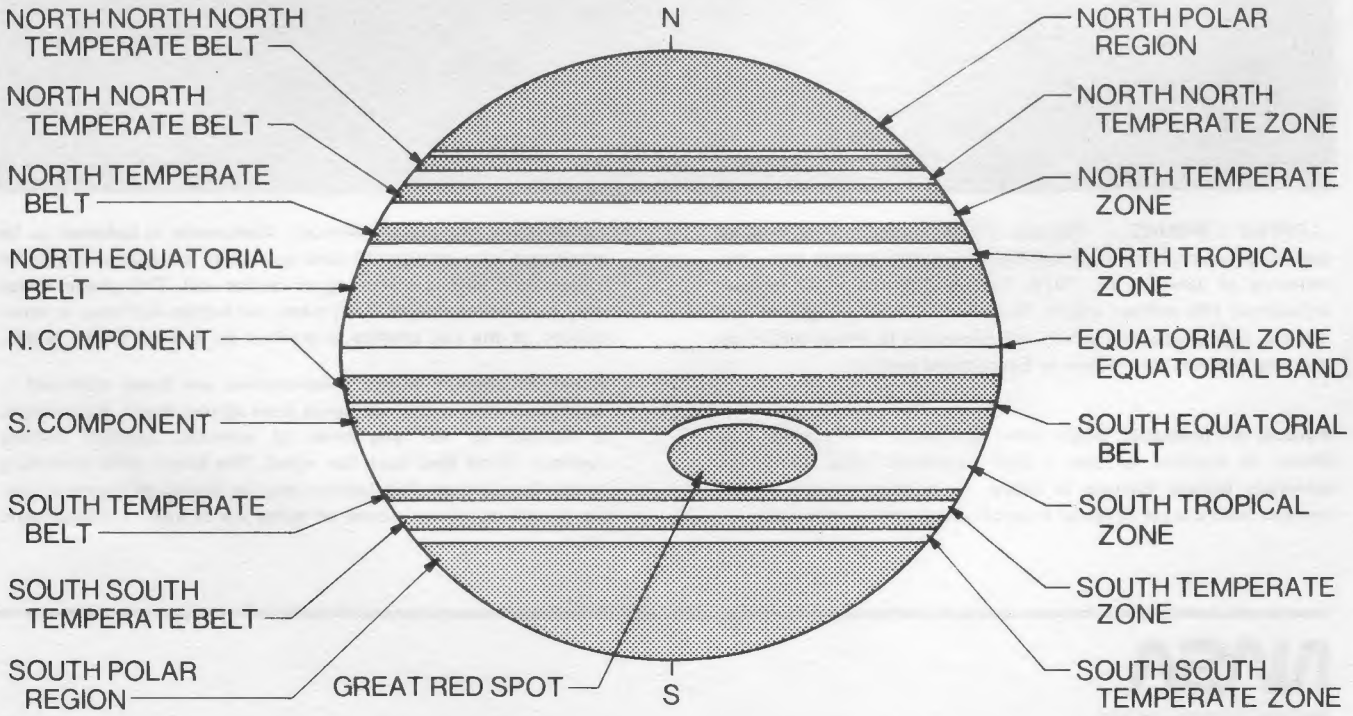
While radiometric data precisely determines the position of the spacecraft in relation to Earth, optical navigation is needed to pinpoint the locations and orbital paths of the satellites. This is accomplished by pointing the camera at a specific satellite and taking a long-exposure image.

Intensive Imaging

On January 30, Voyager 1 will begin a 4-day period of intensive Jupiter imaging, returning pictures in real-time (not tape-recorded for later playback as in the observatory phase). Shuttering every 96 seconds for 100 hours, Voyager 1 will capture 10 Jovian rotations. Narrow-angle images will be taken through three different filters every three degrees of rotation to allow color reconstruction of what will essentially be a "movie" of Jupiter's rapidly changing atmosphere.

At the start of the sequence, the spacecraft will be about 34.7 million kilometers (21.6 million miles) from the planet and Jupiter's disk will fill about 480 pixels (picture elements) of the 800-pixel imaging frame. Travelling with a heliocentric velocity of about 13.2 kilometers per second (29,600 miles per hour), Voyager 1 will gain about 3.9 million kilometers (2.4 million miles) on the planet during the 4-day period of intensive imaging.

Since the imaging data will be returned in real time at the highest data rate available (115,200 bits per second) over X-band, the Deep Space Network will provide continuous 24-hour a day coverage with the 64-meter antennas (only these antennas are capable of receiving this data rate). Voyager 2 and other space probes will be covered by the five 26-meter antennas and one 34-meter antenna (Goldstone) of the Deep Space Network.



MAJOR FEATURES OF JUPITER – Ground-based and Pioneer observations of the giant planet have allowed scientists to label Jupiter's major features for reference purposes. Voyager is already rewriting the textbooks, however, as its cameras record the ever-changing atmosphere. The once-wide south tropical zone is presently considerably narrower, while the north temperate zones have spread. Voyager is also identifying smaller features, such as plumes and hot spots, and tracking their changes.